J. Adelaide Bot. Gard. (15)2: 93-99 (1993)

NEW TAXA AND COMBINATIONS IN THE BORAGINACEAE

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Abstract

Two new taxa, *Ehretia grahamii* Randell and *Trichodesma zeylanicum* var. *grandiflorum* Randell, as well as a new combination *Ehretia saligna* var. *membranifolia* (R.Br.) Randell, are here published. In addition, the nomenclature of Australian material of *Amsinckia* is discussed.

1. **Ehretia saligna** R.Br. var. **membranifolia** (R.Br.) Randell, *comb. nov.*

Basionym: Ehretia membranifolia R.Br., *Prodr.* 497 (1810).
Type: Broad Sound, *R.Brown 102*, 25.ix.1802, n.v.

Shrub or tree to 8 m tall. *Leaves*: blades elliptic, broadly lanceolate to ovate, not falcate, 4-15 cm long, 6-60 mm wide, rarely drooping, ± chartaceous, green; petioles 5-20 mm long. *Inflorescences* terminal on short branchlets, spreading. *Flowers*: specimens either with hermaphrodite flowers, with exserted stigma but anthers almost enclosed in corolla tube; or with male flowers, having exserted anthers but ovary (aborted and drying black), style and stigma enclosed in corolla tube. *Fruit* red, succulent, drying black, splitting into 4 1-seeded nutlets. Peach bush.

Distribution and ecology

Occurs in northern Northern Territory, north-western Queensland and along the eastern highlands from northern Queensland to central New South Wales; usually restricted to vine scrubs, fringing forests or rainforest margins, in contrast to drier habitats occupied by the type variety.

Notes

Robert Brown described two species, *E. saligna* and *E. membranifolia*, based largely on leaf morphology. Bentham (1868) accepted these, but put emphasis on floral differences, describing one species with exserted anthers, the other with enclosed anthers. It is now obvious that these variations represent male and hermaphrodite flowers within a single taxon.

There is considerable variation in leaf morphology within this taxon. As part of the variation seems to be correlated with differing habitats, and the variation pattern is almost continuous, I consider that two separate species cannot be maintained. However, since field work has not been possible, it seems best to retain the two taxa originally described by Brown, at variety level. Future workers will need to re-examine this problem.

The key to varieties of *E. saligna*

Leaves linear to lanceolate, falcate ..... var. *saligna*
Leaves elliptic to lanceolate to ovate, not falcate ..... var. *membranifolia*

Selected specimens (about 50 seen)

NORTHERN TERRITORY: Gregory Natl Pk, *B.G.Thompson s.n.*, 26.ii.1986 (DNA); Tanumbirini station, *B.G.Thompson s.n.*, 22.ii.1988 (DNA).

QUEENSLAND: Lynd Scrub, W Mt Garnet, *L.J.Smith & J.G.Tracey s.n.*, 1962 (BRI, CANB); Hwy c. 130 km N Clermont, *L.G.Adams s.n.*, 12.vii.1964 (CANB, DNA).

NEW SOUTH WALES: "Iolanthe" c. 26 km SW Garah, *K.L.Wilson s.n.*, 2.x.1978 (BRI, NSW).

2. **Ehretia grahamii** Randell, *sp. nov.*

Folia insuper hispidis, subter pubescentibus. Inflorescentia densa globosa nunquam patens. Corolla campanulata. Nuculae 4.

Holotype: Pine Mountain, State Forest 79, *P.I.Forster 7998 & W.J.MacDonald,* 21.iv.1991 (BRI); iso: K, L, MEL, QRS.

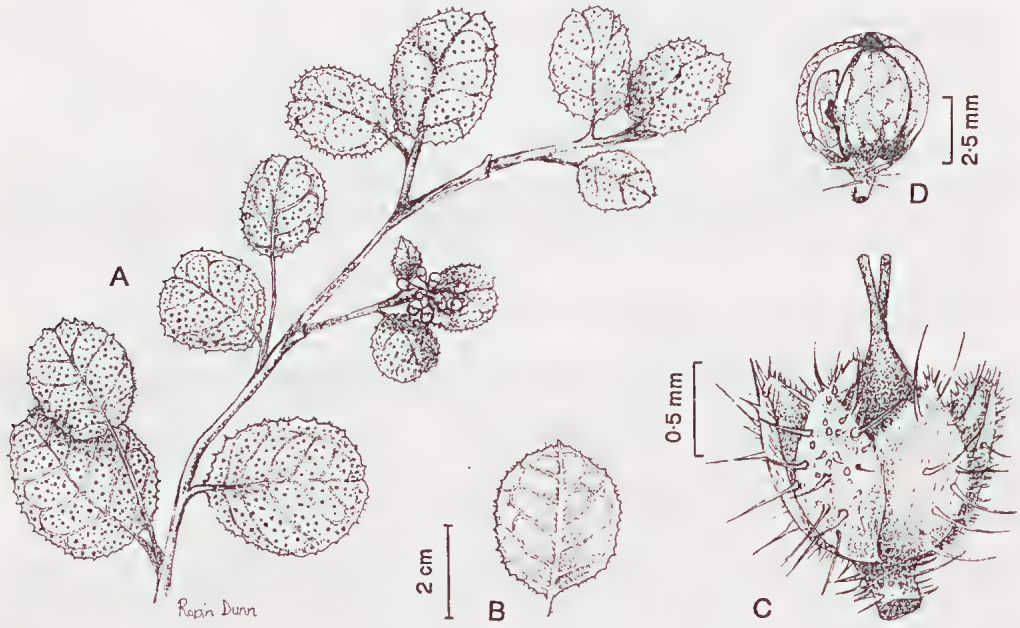

Fig. 1. *Ehretia grahamii* Randell. A, habit showing adaxial leaf surfaces; B, leaf, abaxial surface, both from *N. Gibson 793*; C, calyx with enclosed ovary and bifid style, from *E.R. Anderson s.n.*, 27.ix.1978; D, mature fruit of 4 nutlets, one in sectional view, from *K.A. Williams 82002.*

Shrub or small tree 1-3 m tall. *Branchlets* hairy. *Leaves*: blades elliptic, oblong or ovate, 1.5-6 cm long, 1-4 cm wide, entire, ± scalloped with margins revolute between veins, apex rounded to acute, bicolorous, densely hairy below, sparsely hispid above; petioles 3-5 mm long, hairy. *Inflorescences* dense, globular, terminal on short laterals 2 mm long, never expanding. *Calyx* 1.5 mm long, scarcely fused, lobes lanceolate acute. *Corolla* 3 mm long, campanulate; lobes 1 mm long, acute, strongly recurved. *Anthers* exserted, filaments 3 mm long, inserted 1 mm from

tube base. *Style* split almost to base; stigmas included. *Fruit* (only dry seen) corky, 5 mm diam., breaking into 4 nutlets, each apparently 1-seeded. Fig. 1.

Distribution and ecology

Occurs in softwood scrubs, dry rainforest or vine thickets between Proserpine and Rockhampton, Queensland, on reddish stony soil or light clay. Map 1.

Notes

Flowers in spring or autumn. Differs from the other Australian species in that the leaves are unusually small, and their upper surfaces have hairs which are spreading and rigid, with a prominent ring of white basal cells visible to the naked eye. It is apparently unique in bearing fruit on short branches which never elongate.

Relationships of this species are obscure. It has the leaf hairs and small flowers of *E. asperula* from Java and IndoChina (Johnston, 1951), but in that species the leaves are much larger, and the inflorescence branches are elongate in fruit. Among Australian species, *E. saligna* has larger flowers and larger glabrous leaves, and while *E. acuminata* does have small flowers, it has spreading inflorescence branches, large glabrescent leaves, and fruit splitting into 2 2-seeded nutlets.

I have named this species for my husband, as an indication of my deep affection.

Specimens examined

QUEENSLAND: Mt Britton mine, Homevale station, Nebo, *L.J.Webb & J.Tracey s.n.*, -.xii.1973 (BRI, QPS); 32 km S Lotus Ck, Bruce Hwy between Marleborough and Sarina, *K.A.Williams 82002*, 12.v.1982 (BRI); Percy Island, *G.Innes s.n.*, 13.xi.1981 (BRI); State Forest, Rundle Range, *N.Gibson s.n.*, 27.v.1985 (BRI, NSW) and 28.viii.1985 (BRI); Targinie, Mt Larcom Range, *N.Gibson 793*, 7.v.1986 (BRI).

3. **Trichodesma zeylanicum** (Burm. f.) R.Br. var. **grandiflorum** Randell, *var. nov.*

Frutex. Sepala lanceolata. Corolla campanulata, plerumque alba. Margo antherarum trichomatibus brevibus.

Holotype: Shaw Creek, 2 km downstream from Ayers Rock road, *T.S.Henshall 212b*, 7.ix.1978 (AD); iso: BRI, CANB, K, MEL, NSW, PERTH.

Shrubs 1-2 m tall. *Leaves* linear to lanceolate, 6-12 cm long, 3-15 mm wide. *Inflorescence* bracteate, of paired unbranched cymes, not greatly elongating after flowering . *Pedicels* barely exceeding bract length. *Calyx* lobes 15-20 mm long, not elongating in fruit. *Corolla* campanulate, 15-25 mm long, usually white or rarely blue; tube c. 2 mm long, expanding from base. *Anthers* exserted; terminal appendages of connectives (but not anthers) cohering by tangled lateral hairs. *Style* c. 15 mm long. Fig. 2.

Distribution and ecology

Of localised and dispersed occurrence from Carnarvon in Western Australia, to Docker River in Northern Territory, usually in sand. Flowers in spring. Map 2.

Notes

This taxon has been recognised as distinct for some time (e.g. Mitchell 1981) but has not previously been named. Mitchell considered it as probably of specific rank but I feel that

differences within the Australian materials are not of the same magnitude as those used to recognise species elsewhere in the genus (e.g. Africa).

Australian material of *T. zeylanicum* contains three recognisable forms. Mitchell did not recognise var. *latisepalum* F. Muell. ex Benth. in Central Australia, but in more northern areas its consistently cordate sepals and preference for clay or rocky substrates make it distinctive.

The remaining varieties *zeylanicum* and *grandiflorum* both have lanceolate sepals and are found in sandy soils. However, only once have they been recorded growing in association. The type variety is usually of a more herbaceous habit, with blue rotate corollas; while var. *grandiflorum* has a more robust habit, and white flowers which are campanulate (perhaps correlated with the shorter lateral hairs of the anthers).

The variety name *grandiflorum* describes its larger flowers.

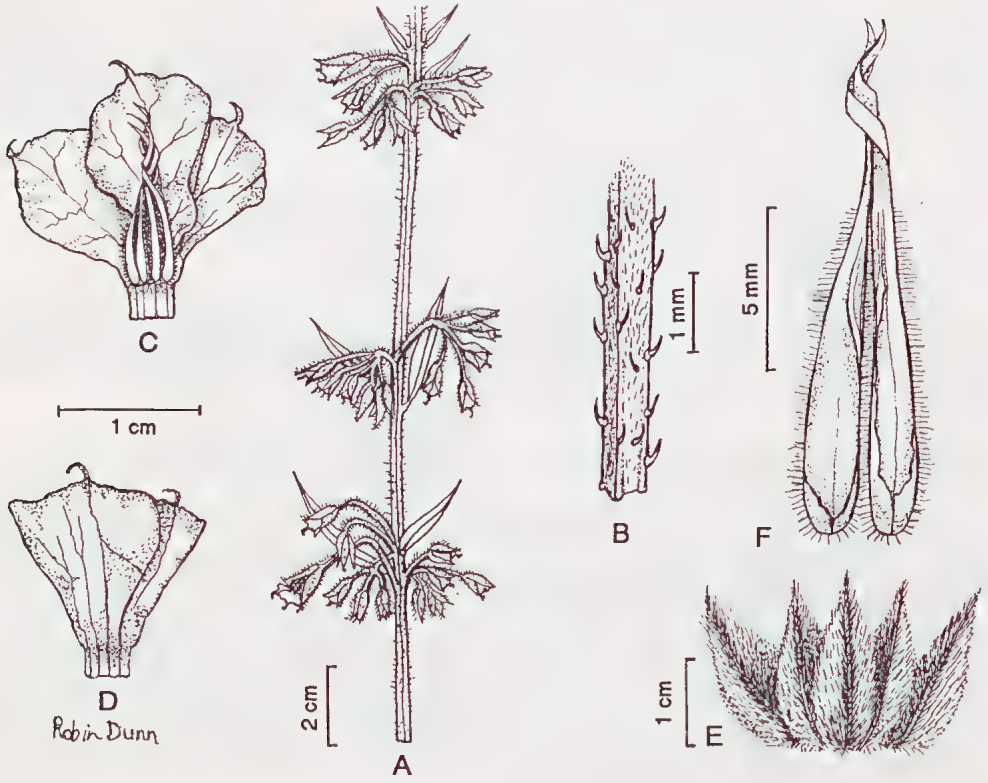

Fig. 2. *Trichodesma zeylanicum* var. *grandiflorum* Randell, all from *T.L. Setter 269*, except D, which is from *E.N.S. Jackson 2952*. A, inflorescence showing paired branches and short pedicels; B, detail of hairs of stem; C-D, campanulate corolla, internal and external views; E, dissected calyx showing lanceolate lobes; F, 2 anthers, showing short marginal hairs.

Selected specimens (about 30 seen)

WESTERN AUSTRALIA: c. 70 km NNE main Wittenoom to Newman road, *E.N.S.Jackson 2952*, 21.viii.1977 (AD, NSW, TI); Carnarvon (W.A.), *A.Ashby 5529*, 12.viii.1977 (AD, BRI, CBG, HO, NSW).

NORTHERN TERRITORY: Petermann Ras., at crossing of Docker River road with Docker R., just E of township, *M.G.Corrick 10405*, 23.vii.1988 (AD, CANB, DNA.)

Map 1. *Ehretia grahamii* Randell. **Map 2.** *Trichodesma zeylanicum* var. *grandiflorum* Randell.

4. **Amsinckia** complex

This genus occurs naturally in North and South America, but at least two species have been introduced to Australia, where they now comprise important weeds of grain crops in southern areas of all mainland states. In most states they are declared pest plants, reportedly toxic to animals (Everist 1981).

There is a problem in determining which specific name(s) should be used here. Previous treatments have separated the Australian material into 2 (in the *Flora of South Australia*) or 3 (in the *Flora of South East Qld*) species. I here cite the key to species given in the latter (Stanley 1986).

1. Corolla throats constricted and closed by intruding hairy saccate processes; stamens inserted low in corolla tube ..... 1. *A. lycopsoides*
1. Corolla throats open or glabrous; stamens inserted in throat
   2. Corollas orange to orange-yellow, conspicuously exserted beyond calyx; stems strigose only, often almost glabrous..... 2. *A. intermedia*
   2. Corollas pale yellow, usually scarcely exserted from calyx; stems hairy as well as strigose..... 3. *A. calycina*

My investigations have revealed a complex biological problem in Australia. While there is variation in flower structure (colour, length and constriction in the corolla tube, length of style, position of anthers) I have not been able to recognise consistent patterns of variation. I am thus forced to recognise only a single complex, not the 2 or 3 species of earlier authors.

American workers (Ray & Chisaki 1957) report that only one species (*A. lycopsoides* Lindley ex Lehm.) has hairy protuberances (crests) in the throat of the corolla tube. *A. lycopsoides* is also unique in regularly having anthers inserted almost at the base of the corolla tube, just above a short constriction. Some Australian plants certainly have low anthers above a constriction, and large crests in the throat, and are thus identifiable as *A. lycopsoides*.

However, in other Australian plants the crests, though present, are smaller, and the hairs are sparse or absent. Anthers are not always at the base of the tube. I have not been able to equate plants having both (small) crests and anthers high in the tube, with any American taxon.

Previous Australian treatments of plants without crests or hairs in the throat have referred them to either *A. calycina* [from S. America] or *A. intermedia* [from N. America]. Unfortunately no recent American author has discussed both these taxa, but comparison of older descriptions (e.g Johnston 1927 and Munz 1974) suggests they are very similar. The relationship between these species will have to be clarified in America, before the identity of Australian material can be established.

Both of these uncrested species are described as having anthers at the throat of the tube. Some Australian plants certainly match this description, and are thus referable to *A. intermedia/calycina*. However, there are other Australian plants where the anthers are low in the tube. Once again, I have been unable to equate this material (uncrested, anthers low in the tube) with any American taxon.

While simple interspecific hybridization probably explains this situation, the occurrence elsewhere in the genus of heterostyly, and also possibly asexuality, indicates that other possibilities should be considered.

Ray and Chisaki (1957) reported outcrossing in some species (apparent hybridization of *A. intermedia* with *A. lycopsoides* Lindley ex Lehm.), and heterostyly in others. Charles Darwin (1877) demonstrated the occurrence of either asexuality or selfing in this taxon [*A. spectabilis* sensu Gray = *A. douglasiana* sensu Macbride = *A. intermedia* Fischer & Meyer = *A. lycopsoides* s.l., see Johnston, (1935)].

Heterostyly has not been recorded for these species in America, but could be operating here. Australian plants do show considerable variation in style length and position of anther insertion. Buds are apparently uniform with the stigma positioned beyond the anthers. The latter are carried upwards as the corolla expands, but their final position probably depends on the degree of corolla expansion.

At maturity of uncrested flowers, the anthers are usually positioned just below the throat of the corolla tube, and the stigma is almost level with them. In a number of cases the style is somewhat below the anthers [the 'thrum' state], and rarely the stigma is still above the anthers [the 'pin' condition]. But in a significant proportion, the anthers remain low in the tube with the stigma at almost the same level, as is the case in *A. lycopsoides*.

It is obvious that breeding system studies are needed to determine the cause of the breakdown of taxonomic distinction in Australia, whether hybridization, asexuality or heterostyly. This would probably also shed light on the identity of the taxa involved.

Vegetatively, there is little variation in the Australian material and in view of the reproductive uncertainties outlined above, I have chosen to treat this as a single complex. It may be helpful to future workers to record that Dr. P. Ray was previously known as Dr. Kamb, and H.F. Chisaki later became Mrs Hommersand (D.J.Connor, in litt., NSW).

Acknowledgements

This study was funded by a grant from the Australian Biological Resource Study. Dr P.Wilson (NSW) and Dr H.Toelken (AD) provided helpful discussions on the nomenclature of *Amsinckia*. I am grateful to the directors of AD, BRI, DNA, NSW and PERTH for permission

to work in their institutions, and to BRI, DNA, and NSW for the loan of materials. Illustrations were kindly provided by Ms Robin Dunn.

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